CLAIMS:

1. Powder for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, with at least a first matrix component that is present in the form of essentially spherical powder particles (18), which is formed by an aromatic polyether ketone plastic, particularly a polyaryl ether ketone (PEEK) plastic, having the repetition unit oxy-1,4-phenylene-oxy-1,4-phenylene-carbonyl-1,4-phenylene

- 2. Powder, particularly according to claim 1, for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, with a first component that is present in the form of essentially spherical powder particles (18; 118; 218; 330; 430), which is formed by a matrix material, and at least another component in the form of stiffening and/or reinforcing fibers (140; 240; 340; 440).
- 3. Powder according to claim 2, wherein the volume proportion of the fibers (140) is up to 25%, preferably up to 15%, particularly preferably up to 10%.
- 4. Powder according to claim 2, wherein the fibers (240; 340; 440) are embedded in the matrix material (118; 330), preferably in such a manner that they are essentially completely surrounded by the matrix material.
- 5. Powder according to claim 4, characterized in that the volume proportion of the fibers (240; 340; 440) is greater than 15%, preferably greater than 25%.

- 6. Powder according to one of claims 2 to 5, characterized in that the matrix material is formed by a thermoplastic plastic.
- 7. Powder according to claim 6, characterized in that the matrix material is formed by a polyamide with higher cross-linking, such as PA11 or PA12.
- 8. Powder according to claim 6 or 7, characterized in that the fibers are formed by carbon and/or glass fibers.
- 9. Method according to one of claims 1 to 8, wherein the average grain size d50 of the spherical powder particles lies in the range of 20 to 150, preferably 40 to 70 μm.
- 10. Powder according to one of claims 2 to 5, characterized in that the matrix material is formed by a metallic material.
- 11. Powder according to claim 10, characterized in that the fibers are selected from the group of ceramic fibers and boron fibers.
- 12. Powder according to claim 9 or 10, wherein the average grain size d50 of the spherical powder particles lies in the range of 10 to 100, preferably 10 to 80 μm.
- 13. Powder according to one of claims 2 to 12, characterized in that the average length L50 of the fibers (140; 240) corresponds to maximally the value of the average grain size d50 of the spherical powder particles (118; 218; 330; 430).
- 14. Method for the production of a powder, particularly according to one of claims 1 to 13, having essentially spherical powder particles, for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, wherein optionally, stiffening and/or reinforcing fibers () are embedded in the powder particles () consisting of a thermoplastic matrix material, having the following method steps:

- a) Formation of a suspension having a matrix micropowder (22; 322) stirred into a liquid phase (20; 320), such as ethanol or an ethanol/water mixture, having a particle size that lies significantly below the dimension of the powder particle to be produced, and optionally having reinforcing and/or stiffening fibers (340) having a length that lies below the dimension of the powder particles to be produced;
- b) Spraying of the suspension through a nozzle, to form droplets (32; 332) containing matrix micropowder and, optionally, fibers; and
- c) Vaporization and/or evaporation of the volatile component (26; 326) of the droplets, leaving essentially spherical agglomerates (30; 330) behind.
- 15. Method for the production of a powder, particularly according to one of claims 2 to 13, having essentially spherical powder particles, for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, wherein stiffening and/or reinforcing fibers (340) are embedded in the powder particles (330) consisting of a metallic matrix material, having the following method steps:
- a) Formation of a suspension having a matrix micropowder (322) stirred into a liquid phase (320), such as ethanol or an ethanol/water mixture, having a particle size that lies significantly below the dimension of the powder particle to be produced, and having reinforcing and/or stiffening fibers (340) having a length that lies below the dimension (DP) of the powder particles to be produced;
- b) Spraying of the suspension through a nozzle, to form droplets (332) containing matrix micropowder and fibers; and
- c) Vaporization and/or evaporation of the volatile component (326) of the droplets, leaving essentially spherical agglomerates (330) behind.
- 16. Method according to claim 14, wherein micropowder (22; 322) having an average grain size d50 between 3 and 10 μ m, preferably 5 μ m, and optionally, fibers (340) having an average length L50 of 20 to 150 μ m, preferably 40 to 70 μ m, are used.

- 17. Method according to claim 15, wherein micropowder (322) having an average grain size d50 between 3 and 10 μ m, preferably 5 μ m, and fibers (340) having an average length L50 of 10 to 100 μ m, preferably 10 to 80 μ m, are used.
- 18. Method according to one of claims 14 to 17, characterized in that the spraying of the suspension takes place in such a manner that essentially spherical microdroplets (32; 332) having an average diameter d50 of 10 to 70 µm are formed.
- 19. Method according to one of claims 13 to 15, characterized in that the vaporization and/or evaporation step is carried out while the droplets (32; 332) are being moved through a heating segment.
- 20. Method for the production of a powder, particularly according to one of claims 1 to 13, having essentially spherical powder particles, for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, wherein optionally, stiffening and/or reinforcing fibers (440) are embedded in the powder particles (430) consisting of a thermoplastic matrix material, having the following method steps:
- a) Cooling of coarse granulate (450) made of optionally fiber-reinforced plastic, below a temperature at which the matrix material becomes brittle;
 - b) Grinding of the cooled granulate; and
- c) Separation of the ground material, in accordance with a predetermined fraction spectrum.
- 21. Method according to claim 20, characterized in that the step of grinding takes place using a pinned disk mill (460).
- 22. Method according to claim 20 or 21, characterized in that the step of grinding takes place with additional cooling.
- 23. Method according to one of claims 20 to 22, characterized in that the method step of separation takes place using an air separator (480).

- 24. Method according to one of claims 20 to 23, characterized in that the ground material is subjected to smoothing treatment, for example by embedding or accumulation of microparticles and/or nanoparticles, such as Aerosil.
- 25. Method for the production of a powder, particularly according to one of claims 1 to 13, having essentially spherical powder particles, for use in the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, wherein optionally, stiffening and/or reinforcing fibers () are embedded in the powder particles consisting of a matrix material, having the following method steps:
 - a) Melting the matrix material;
 - b) Optionally stirring the fibers into the melt;
- c) Blowing the melt, which optionally contains the fibers, through a nozzle, to form droplets that optionally contain fibers; and
 - d) Passing the droplets through a cooling segment.
- 26. Method according to claim 25, characterized in that the atomization of the melt takes place in a hot gas jet.
- 27. Method according to claim 25 or 26, characterized by the additional method step of separating the powder particles in accordance with a predetermined fraction spectrum.
- 28. Method for the production of spatial structures, i.e. molded bodies, by means of layer build-up methods (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, using a powder according to one of claims 1 to 13.
- 29. Molded body that can be obtained by means of a layer build-up method (powder-based generative rapid prototyping method), such as according to SLS (selective laser sintering) or laser melting technology, using a powder according to one of claims 1 to 13.

30. Molded body according to claim 29, having interior reinforcements, preferably
three-dimensional framework-like reinforcements.